

NAME: \_\_\_\_\_

Time Started: \_\_\_\_\_

**BIO 112: Evolution, Organisms, & Ecosystems, Dr. Paradise**

**Review 2, FA 2007**

**Instructions:** This review is worth 150 points (~15% of your course grade) and will be due by 5:00 pm on Tuesday, 11/6/07. No exceptions and late reviews will result in at least a 5% deduction. **You may not consult** any references or any other person while working on this review. Your signature at the bottom of the last page signifies that the work is yours alone and is pledged under the Honor Code. When you break the seal on the envelope you will have **three hours to complete the review!** Please print legibly; I can only grade what I can read! For each question or part to a question, limit your answers to the space below each question, unless otherwise specified. Any part of your answer outside of the space provided **will not be graded.**

1. Provide a detailed example of a negative feedback mechanism in the excretory system of mammals that also works to maintain homeostasis in the circulatory system (10 points).
  
2. Answer the following questions regarding the regulation of body temperature in mammals (15 points).
  - a. How would you classify their type of thermoregulation?
  
  - b. Where is temperature sensed and where is this information sent?
  
  - c. What is one behavioral response exhibited by mammals when they are too hot?
  
  - d. What is one physiological response exhibited by mammals when they are too cold?
  
3. Answer the following questions related to circulatory and respiratory systems (15 points).
  - a. Why does an open circulatory system seem counterintuitive for insects, and what adaptations do they have that allow them to have this type of circulatory system?
  
  - b. Provide an example of how  $Q$  in Fick's Law of Diffusion is maximized during gas exchange with the help of the circulatory system.
  
  - c. Why is having a closed circulatory system important for an earthworm?



- c. To what novel environments are humans exposed, and why does this exposure create an evolutionary dilemma?
7. Why is it important for mammals to maintain blood pressure within certain limits? Provide two reasons (10 points).
8. How do the nervous and endocrine systems integrate the circulatory and excretory systems of mammals? Provide two examples of why these two latter systems need to be controlled together (10 pts).
9. How are carbohydrate and fat metabolism affected in persons with type 2 (adult-onset) diabetes? Consider both short and long-term problems, and be sure to indicate how different physiological systems are interconnected (15 points).
10. Describe the evolution of reproductive systems in animals. In particular, consider how habitat, phylogenetic relationships, mobility, and abundance of potential mates all may play a role in determining the evolution of a species' reproductive strategy (10 points).
11. Describe what happens in your digestive system as you begin to consume food after a short period of fasting. Be sure to illustrate your description with physiological concepts and indicate where other systems are integrated with the digestive system (10 points).
12. Describe the integration of **up to** four (4) systems that we've studied and how they specifically affect other systems or are affected by other systems **during exercise or other activation of large groups of muscles**. BE SPECIFIC in your examples and use of terminology. Use only **one sentence** for each example (>1 example can come from the same system). Each example will be worth 10 points **divided by** the total number of examples you use (e.g., if you choose 2 examples, they will be worth 5 points each; 4 will be worth 2.5 each).